Consequently, claims 1-4 and 15-22 are currently pending in the instant application.

Initially, addressing the Examiner's formalistic rejections, claims 4 and 18-20 were rejected under 35 U.S.C. §112, second paragraph, for being indefinite. Specifically, the Examiner alleges that the use of alternative language in claims 4 and 20 with regard to the type of laser makes the claims indefinite. Further, in claim 18, the recitation that the semiconductor is "intrinsic or substantially intrinsic" is considered indefinite.

Claims 4 and 20 have been amended to delete "or YAG laser" from each of these claims, and new claims 21 and 22 have been added to recite this deleted feature. Further, claim 18 has been amended to change "intrinsic or substantially intrinsic" to "at least substantially intrinsic". These claims, as amended, should overcome the Examiner's rejections and place them in a condition for allowance.

The present invention is directed to a semiconductor material which is crystallized to have a peak of intensity of scattered light at a Raman shift of 512 cm^{-1} or more in Ramans spectroscopy thereof. Specifically, the semiconductor material is formed by melting a non-crystal semiconductor including carbon, nitrogen and oxygen each at a concentration of $5x10^{19}$ atoms$\cdot cm^{-3}$ or less by irradiating the same with a laser beam or equivalent thereof to crystallize the non-crystal material. Such a semiconductor layer may be an activation layer in a thin film transistor. The problems associated with conventional laser annealing are overcome to provide a practically feasible thin film semiconductor material having improved characteristics.

non of the process limitation related to the method of making the silicon are given weight during examination of device claim

Claims 1-4 and 15-20 were rejected under 35 U.S.C. §103 over Pankove, in view of Wolf et al. Pankove discloses an insulating structure which includes electrically conductive portions. Specifically, a substantially

insulating film of silicon, which may be non-crystalline, is formed and then selectively irradiated with a YAG laser to form a conductive portion or portions. The silicon film is actually disclosed to be oxygenated such that the starting material includes approximately 20 atomic percent oxygen in the case of N or P type oxygenated polysilicon. (See, col. 1, line 67 of Pankove.) As a result, there is absolutely no suggestion therein to reduce the level of oxygen, as recited in claims 1 and 15. In fact, Pankove teaches away from the present invention because it discloses the use of a starting material intended to include a relatively high level of oxygen. Further, Pankove does not disclose the desirability of maintaining carbon or nitrogen impurities below a certain level.

Wolf et al. merely discloses a method for measuring the presence of oxygen and carbon in single crystal silicon and is relied upon by the Examiner to show that single crystal silicon may include oxygen and carbon as impurities. Nothing in either of these references teaches the use of a non-crystalline semiconducting starting material including the recited impurities, let alone at the recited impurity levels. Further, Wolf et al. merely suggests that carbon and oxygen may be present in a single crystal silicon, but does not in anyway suggest the desirability of maintaining such impurities below a certain level to form a highly mobile crystallized semiconductor.

Further, the Examiner implies that the irradiation of Pankove would provide the recited level of concentrations. However, nothing in Pankove would suggest that the use of irradiation has anything to do with these impurities, but instead merely provides a conductive area in a silicon film. Pankove does not even suggest that the starting materials are melted and crystallized by the laser. Moreover, due to the higher level of oxygen concentration, the carrier mobility of the resulting layer obtained by Pankove

whatever steps taken before to make the device are irrelevant. The final structure

must be deficient to the claimed invention for the reasons set forth in detail on page 7 of the specification of the instant application.

In addition, the recitation of the Raman shift is important to the present invention because the inventors of the present invention recognized that above 512 cm^{-1}, a slight shift in Raman peak results in a large increase in electron mobility. (See, Figure 2 of the instant application.) This is due to the high degree of melting which occurs when the Raman shift is above the recited level. The degree of melting of the semiconducting material is important in achieving high electron mobility. Pankove in no way suggests the desirability of achieving a certain degree of high level melting to achieve the conductivity disclosed therein.

In view of the foregoing, it is respectfully requested that the rejections of record be reconsidered and withdrawn by the Examiner, that claims 1-4 and 15-20 be allowed, that new claims 21-22 be allowed and that the application be passed to issue. If the Examiner believes a conference would be of benefit in expediting the prosecution of the instant application, she is hereby invited to telephone counsel to arrange such a conference.

Respectfully submitted,

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